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NEW HOST AND LOCALITY RECORDS OF THE COMMENSAL *ADYTE CRINOIDICOLA* (POLYCHAETA:POLYNOIDAE)

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ABSTRACT

Adyte crinoidicola (Potts, 1910) is recorded from Australian waters for the first time. An amended description is provided. The number of known host crinoid species is increased from 3 to 17.

INTRODUCTION

Commensalism is relatively uncommon among polychaetes. However, approximately two-thirds of all commensal polychaetes are members of the family Polynoidae (Clark, 1956). A discussion of the possible historical and morphological attributes which have contributed to the adoption of commensalism by so many of the polynoidae can be found in Ushakov (1977).

Several of the commensal associations involving polynoids and echinoderm hosts have been relatively well investigated. Both host and commensal have been accurately identified and subjected to experimental analysis of the maintenance of the relationship between them (Davenport, 1950, 1953 a, b; Davenport & Hickok, 1951).

Available records (Gibbs, 1971) indicate many polynoids are able to utilize a number of potential hosts. It follows that in some cases, the range of host species utilized by a commensal is not well documented. This is particularly true of those polynoids commensal on Crinoidea. Examination of the literature reveals the host has not often been identified further than class.

Collections of crinoids from coastal waters of the Northern Territory of Australia between 1981 and 1983 revealed that one species of polynoid *Adyte crinoidicola* (Potts, 1910) was a common commensal of many of the crinoid species encountered. This represents the first record of *A. crinoidicola* from Australia.

Adequate material was available to show that significant variation exist in the characters previously used for diagnosis at the species level. An amended description of the species, taking this variability into account, is provided.

The following abbreviations are used in this paper:

BMNH — British Museum of Natural History
NTM — Northern Territory Museum of Arts and Sciences
USNM — United States National Museum

Adyte crinoidicola (Potts, 1910) (Fig. 1)

Polynoe crinoidicola – Potts, 1910, p. 337, pl. 18, fig. 10, pl. 20, fig. 30, pl. 21, figs. 39-41.

Scalisetosus (Polynoe) crinoidicola – Horst, 1917, p. 98, pl. 16, figs. 6-8, pl. 21, fig. 1.

Scalisetosus crinoidicola – Okuda 1936, p. 564, fig. 3.

Scalisetosus longicirrus – Fauvel, 1953, p. 50, fig. 22, a-c. – Day, 1962, p. 631; 1967, p. 58, fig. 1. 7, a-f. – Imajima and Hartman, 1964, p. 38. – Gibbs, 1969, p. 452; 1971, p. 126.

Not *Polynoe (L.) longicirra* – Schmarda, 1861.

Paradyte (Scalisetosus) crinoidicola – Pettibone, 1969, p. 13, 16, fig. 7, a-g.

Adyte (Paradyte) crinoidicola – Muir, 1982, p. 167.

Material examined — Maldives, Hulule, Male Atoll, coll. J. Stanley Gardiner, on crinoid from west reef with a crustacean 1899. – Syntype (BMNH ZK 1924. 3.1.85). South Africa, Inhaca Island, Delagoa Bay, 25° 50′S, 32° 50′E, commensal on crinoid *Tropiometra carinata* – 1 specimen (BMNH 1963 : 1: 10). Caroline Islands, Ifalik Atoll, F.M. Bayer, D.P. Abbott collectors, 1953–4 specimens (USNM 22972, 22973, 22976). Marshall Islands, Enewetak Atoll, 11° 30′N, 162° 15′E, coll. D.L. Zmarzly, commensal on crinoids *Comanthina schegeli*, *Comanthus bennetti*, 1980 – 5 specimens (NTM W 313, 314, 315, 316, 317). Australia (Northern Territory): commensal on crinoids: Anglers Reef, Darwin, 12° 18.7′S, 132° 52′E, coll. R. Hanley, 5-6m. 1982. – 1 specimen (NTM W 257). Northwest Vernon Island, 12° 2.5′S, 131° 4.5′E, coll. P. Alderslade, 20m. 1982. – 1 specimen (NTM W 260). Sandy Island No. 2. 11° 5′S, 132° 16.5′E, coll. R. Hanley, J.N.A. Hooper, P. Horner, P. Alderslade, 6-14m 1981, 1982 – 17 specimens (NTM W 261, 263, 264, 266, 267, 41-47). New Year Island, 10° 5′S, 133° 1′E, coll. R. Hanley, 10-18m, 1982 – 9 specimens (NTM W 282-286, 298, 299). Black Point, Port Essington, 11° 10′S, 132° 9′E, coll. H. Larson, P. Horner, 13m, 1981 – 2 specimens (NTM W 187). Trepang Bay, 11° 10′S, 131° 58′E, coll. R. Hanley, reef flat pool at low tide, 1981 – 1 specimen (NTM W 40). Coral Bay, Port Essington, 11° 10′S, 132° 4′E, coll. R. Hanley, 2.5-5m, 1981 – 2 specimens (NTM W 39, 182).

Description — Body flattened, fragile, elongate-oval, tapered posteriorly, dorsally darkly pigmented forming two longitudinal bands on either side of a lighter, unpigmented midline. Two prominent, transverse, dorsal ciliated bands per segment. Segments 36-48, 15 pairs of elytra. Elytra arranged on segments 2, 4, 5, 7, alternate segments to 23, 26, 29 and 32. Elytra delicate, smooth, without tubercles or fringes of papillae, with numerous sensory papillae. Elytra darkly pigmented in many small patches interspersed with lighter, almost transparent patches. Prostomium bilobed, with lobes rounded, subtriangular anteriorly, without distinct cephalic peaks, with 2 palps and 3 antennae, ceratophore of lateral antennae distinct, inserted ventrally. Tentacular segment with two pairs of tentacular cirri, without setae; without facial tubercle. Buccal segment without dorsal nuchal fold; with long ventral buccal cirri. Parapodia subbiramous. Notopodia with short, conical acicular lobes. Notosetae stouter than neurosetae, curved and sabre-like, with 1-8 widely spaced spines along the curved border, tips notched. Within a bundle of notosetae, the number of spines on individual notosetae varies as much as when different bundles of notosetae are compared, irrespective of which body segments are examined. Neurosetae of 3 kinds. Supra-acicular neurosetae slender, with basal semilunar pockets and more distal elongate spinous regions and slightly hooked bifid tips. Subacicular neurosetae much stouter, with basal semilunar pockets and short falcate, smooth tips. Intermediate type of neurosetae, subacicular group immediately below the aciculum, falcate, but only slightly hooked, distance between basal semilunar pocket and tip greater than in other subacicular neurosetae, often with faint spinous patches. Dorsal cirri with cylindrical cirrophores, bulbous basally; styles long,

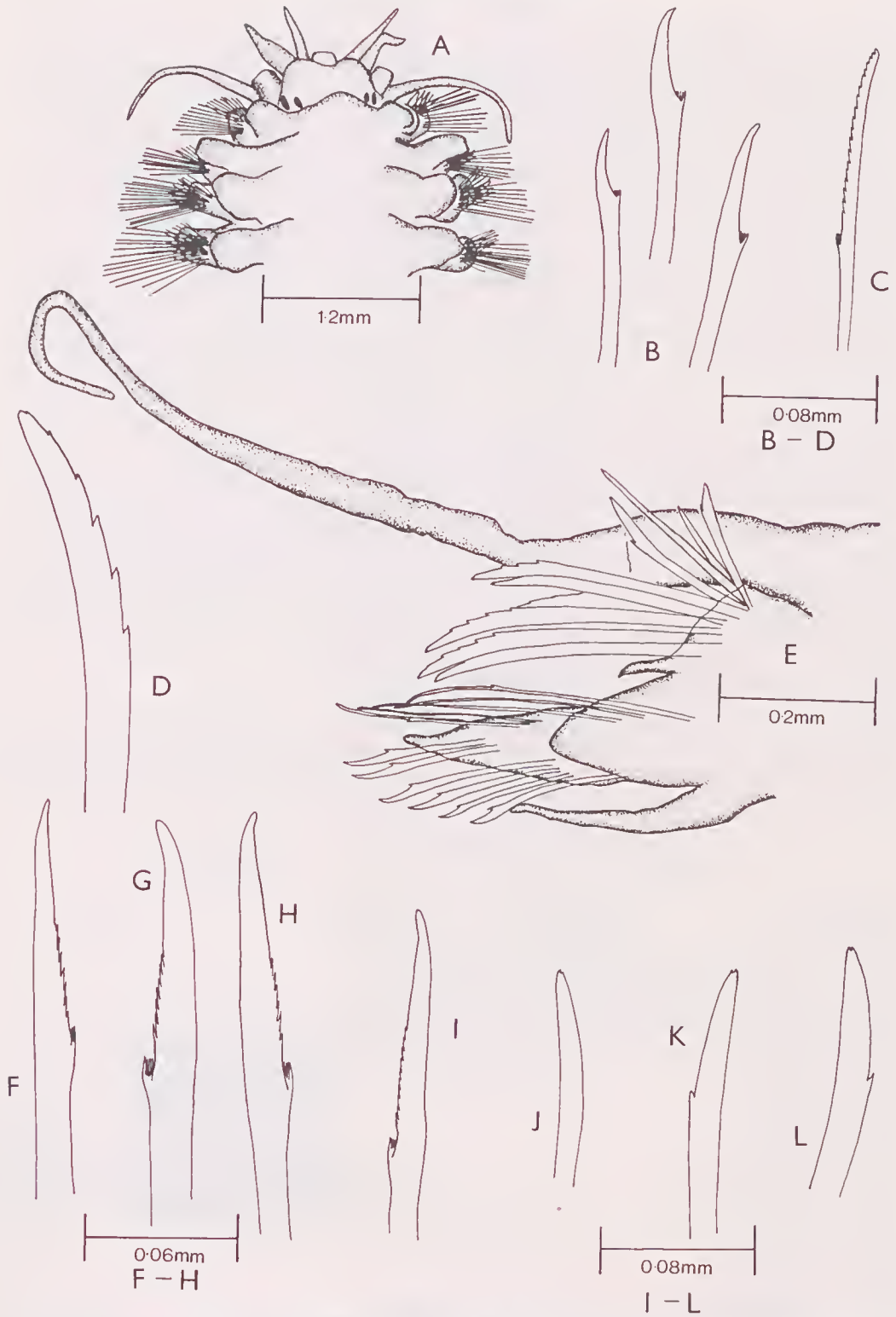

Fig. 1. *Adyte crinoidicola* (Potts). A. anterior end, B. typical subacicular neurosetae, C. supra-acicular neuroseta, D. notoseta, E. parapodium, F., G., H., I., variant subacicular neurosetae with spinous ridges between semilunar pocket and tip, J., K., L., notosetae. A-E, J-L, NTM W 286; F-I, USNM 22976.

smooth, tapering. Dorsal tubercles inconspicuous. Ventral cirri short, subulate. Pharynx has 9 dorsal and 11 ventral papillae, the lateral pair are small. Nephridial papillae distinct, short and begin on segment 8.

Remarks — Pettibone (1969) describes *A. crinoidicola* (as *Paradyte crinoidicola*) with about 40 segments. The 44 specimens examined by the author had between 36 and 48 body segments. The largest specimens (from 11-22mm) had the greatest number of segments, and in these larger specimens, some of the posterior segments (10 or fewer) protruded beyond the posterior edges of the last pair of elytra.

Examination of these specimens also revealed greater variation in the number of spines occurring along the convex border of the notosetae than previously observed. While most individuals had a range of between 1 to 5 spines on each of their notosetae, a few specimens had a range of 1 to 3 notosetal spines. The minimum range was seen on NTM W 40 where 0-2 notosetal spines were observed on the notosetae examined. The maximum range occurred on notosetae of NTM W 298 where a range of 1 to 8 spines were observed. Pettibone (1969) used the number of notosetal spines as one of the characters distinguishing *A. crinoidicola* from *A. tentaculata* (as *Paradyte tentaculata*). *Adyte crinoidicola* was described with a range of 1 to 5 notosetal spines and *A. tentaculata* a range of 1-3. As some of the specimens of *A. crinoidicola* examined by the author had only 1-3 spines, this character is not useful by itself in differentiating between the two species. Its value in species determination in conjunction with other characters depends on the establishment of the range of notosetal spines found in a similarly sized sample of *A. tentaculata.*

A small section of the subacicular group of neurosetae have, in some of the specimens examined, spinous patches between the semilunar pocket and the tip. These neurosetae resemble the neurosetae described for *A. tentaculata* by Pettibone (1969). However, they are few in number, (3-7) when compared to the bulk of the neurosetae which lack the spinous patches. It is unlikely that any confusion with specimens of *A. tentaculata*, in which all the neurosetae have spinous patches between pocket and tip, could occur.

Habitat — Commensal on crinoids. Table 1 lists the known host crinoid species utilized by *A. crinoidicola*. The number of known host species is increased from 3 to 17.

Table 1. Crinoid host species of *A. crinoidicola*

New Records		Previous Records	
Northern Territory Host Species	**Enewetak Atoll Host Species**	**Host Species**	**Reference**
Capillaster multiradiatus	*Comanthina schelegi*		
Comantheria rotula	*Comanthus bennetti*		
Comanthina belli			
		* *Astropecten* sp.	Fauvel, 1953
Comanthus parvicirrus			
Comatella stelligera			
Comantula purpurea			
Zygometra comata			
Himerometra robustipinna		*Himerometra robustipinna*	Gibbs, 1969
Lamprometra palmata		*Lamprometra klunzingeri*	Day, 1967
Stephanometra indica			
Oligometra carpenteri			
Oligometra serripinna			
Petasometra helianthoides			
		Tropiometra carinata	Day, 1962, 1967

* *Astropecten* is an asteroid

DISCUSSION

All published records of *Adyte crinoidicola* suggest the species is an obligatory commensal as it has never been collected free living. The record of this species from the asteroid *Astropecten* (Fauvel, 1953) is unusual, as in all other cases the host has been a crinoid.

This scaleworm's ability to utilize at least 17 species of crinoid as hosts is probably due to the essentially similar suspension feeding method employed by all crinoids. This hypothesis is supported by the presence of several species of crinoids each with specimens of *A. crinoidicola* on them at a number of the sites in the Northern Territory where crinoids were collected. Often 6 or 7 species were in similar situations and engaged in feeding when collected; therefore it seems likely they were all collecting similar food from the surrounding water. The transport of this food down the ciliary tracts within the ambulacral grooves of crinoids would provide ample opportunity for these scaleworms to scavenge some of the food particles (Gibbs, 1969).

An interesting aspect of the presence of several crinoid host species at many of the collection sites was the lack of evidence of any preference by *A. crinoidicola* for a particular species of host. At these sites, scaleworms were randomly distributed amongst individuals of the crinoid host species. Whichever host species were present, there were always some individuals of each of the host species without specimens of *Adyte crinoidicola*. The size of the host specimen did not appear to be important in governing whether or not it had a worm resident upon it. Although in general, the larger scaleworm specimens occurred on the larger crinoids, there were many large crinoids upon which small scaleworms were found.

It is possible that once a scaleworm has taken up residence upon one of these crinoid hosts it remains with and grows with that host, as there is always a good match of the worm's coloration and that of its host. *Adyte crinoidicola* appears limited to variations in red, brown and cream pigments. Consequently *A. crinoidicola* may be absent from some of the crinoid species found in Northern Territory waters because of an inability to achieve the coloration necessary for effective camoflage from predators while resident on those species.

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RESUMÉ

Adyte crinoidicola est, pour la premiére fois noté dans les eaux australiennes. Une déscription corrigée est pourvue. Le nombre d'hôtes reconnus des espèces crinoides va maintenant dc 3 à 17.

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